

What is claimed is:

1 1. A method of reducing power consumption in a semiconductor memory device having
2 a row of memory cells and circuitry for operating the row of memory cells, the method
3 comprising the steps of:

4 providing an intervention circuit;

5 instantiating the intervention circuit within the circuitry for operating the row of
6 memory cells, proximal to the row of memory cells;

7 operating the intervention circuit to retain the row of memory cells in a desired state;

8 and

9 powering down the circuitry for operating the row of memory cells preceding the
10 intervention circuit.

1 2. The method of claim 1, wherein the row of memory cells comprises a wordline and
2 the circuitry for operating the row of memory cells comprises driver circuitry.

1 3. The method of claim 1, wherein the intervention circuit comprises a resistor.

1 4. The method of claim 1, wherein the intervention circuit comprises a transistor.

1 5. The method of claim 2, wherein the intervention circuit is instantiated such that the
2 driver circuitry is between the intervention circuit and the wordline.

1 6. The method of claim 2, wherein the intervention circuit is instantiated between the
2 wordline and driver circuitry.

1 7. The method of claim 1, wherein the steps of operating the intervention circuit and
2 powering down the control circuitry are performed concurrently.

1 8. The method of claim 7, wherein the intervention circuit is operated by a signal source
2 that also powers down the control circuitry.

1 9. The method of claim 1, wherein a nominal delay follows the step of operating the
2 intervention circuit before powering down the control circuitry is performed.

1 10. The method of claim 9, wherein the intervention circuit is operated by a first signal
2 source, separate from a second signal source that powers down the control circuitry.

1 11. A semiconductor device comprising:
2 a row of memory cells;
3 control circuitry preceding the row of memory cells; and
4 an intervention circuit, instantiated within the control circuitry proximal to the row of
5 memory cells, adapted to hold the row of memory cells at a desired state while control
6 circuitry preceding the intervention circuit is powered down.

1 12. The device of claim 11, wherein the row of memory cells comprises a wordline and
2 the control circuitry preceding the row of memory cells comprises driver circuitry.

1 13. The device of claim 11, wherein the intervention circuit comprises a resistor.

1 14. The device of claim 11, wherein the intervention circuit comprises a transistor.

1 15. The device of claim 12, wherein the intervention circuit is instantiated such that the
2 driver circuitry is between the intervention circuit and the wordline.

1 16. The device of claim 12, wherein the intervention circuit is instantiated between the
2 wordline and driver circuitry.

1 17. The device of claim 12, wherein the intervention circuit is coupled to a first assertion
2 signal source that is also coupled to the driver circuitry.

1 18. The device of claim 12, wherein the intervention circuit is coupled to a first assertion
2 signal source, and a second assertion signal source is coupled to the driver circuitry.

1 19. A wordline circuitry segment in an SRAM device, the circuitry segment comprising:
2 a first node coupled to a wordline enable signal;
3 a second node coupled to a wordline signal;
4 a third node coupled to a sleep mode assertion signal;

5 a fourth node coupled to a first reference voltage;

6 a fifth node coupled to a second reference voltage;

7 a first transistor structure, having a first terminal coupled to the first node, a second
8 terminal coupled to the fourth node, and a third and fourth terminal;

9 a second transistor structure, having a first terminal coupled to the fourth terminal of
10 the first transistor structure, a second terminal coupled to the fourth node, a third terminal
11 coupled to the third terminal of the first transistor structure, and a fourth terminal coupled to
12 the second node;

13 a third transistor structure, having a first terminal coupled to the third node, a second
14 terminal coupled to the third terminal of the first transistor structure, and a third terminal
15 coupled to a third reference voltage; and

16 a fourth transistor structure, having a first terminal coupled to the fifth node, a second
17 terminal coupled to the fourth node, and a third terminal coupled to the second node.

1 20. The circuitry segment of claim 19, wherein the fifth node is coupled to the third node.

1 21. A wordline circuitry segment in an SRAM device, the circuitry segment comprising:

2 a first node coupled to a wordline enable signal;

3 a second node coupled to a wordline signal;

4 a third node coupled to a sleep mode assertion signal;

5 a fourth node coupled to a first reference voltage;

6 a fifth node coupled to a second reference voltage;

7 a sixth node coupled to a third reference voltage;

8 a first transistor structure, having a first terminal coupled to the first node, a second
9 terminal, a third terminal coupled to the fifth node, and a fourth terminal;

10 a second transistor structure, having a first terminal coupled to the fourth terminal of
11 the first transistor structure, a second terminal coupled to the fourth node, a third terminal
12 coupled to the fifth node, and a fourth terminal coupled to the second node;

13 a third transistor structure, having a first terminal coupled to the third node, a second
14 terminal coupled to a fourth reference voltage, and a third terminal coupled to the second
15 terminal of the first transistor structure; and

16 a fourth transistor structure, having a first terminal coupled to the sixth node, a second
17 terminal coupled to the first terminal of the second transistor structure, and a third terminal
18 coupled to the fifth node.

1 22. The circuitry segment of claim 21, wherein the sixth node is coupled to the third
2 node.